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The Ark and the Archive

Abstract: Between the mid-seventeenth and early nineteenth centuries, the figure of Noah's Ark played an intriguing role in guiding principles of preserving, ordering and interpreting collections of natural and artificial commodities. Three exemplary collections are chosen to bring out this relation between the archival and the ambiguous character of such assemblages of goods and specimens: projects to make sense of naval antiquity in the early modern maritime world of Pepys and his colleagues; the exchange of goods between European and Polynesian navigators in the wake of the British entry into the Pacific at the period of Cook's voyages; and the notorious collections of British artefacts shipped to China in the East India Company's frustrated embassy of 1793. In each case, the temporal and historical ambiguities of the elements making up such collections were dramatised through the challenges of placing them in providentialist and political histories of navigation and technical prowess. Such episodes, which each had important literary and ideological aftermaths, help clarify the equivocation that often governed cross-cultural traffic in the classical age.

"…all discoveries jumbled from the flood,
Since first the leaky ark reposed in mud,
By more or less, are sung in every book,
From Captain NOAH down to Captain COOK" (Byron, *English Bards and Scotch Reviewers*, 1809, ll. 347-50)

Discoveries about the Ark did not cease with the Deluge. "Noah's Ark must needs be made of some extraordinary timber and plank that could remain good after having been an hundred years in building, whereas our thirty new ships are some of them rotten within less than five": so Samuel Pepys judged the apparent wonders of antediluvian wood, in comparison with the major shipbuilding programme launched by the Royal Navy in the 1680s. The passage comes from his *Naval Minutes*, notes extracted over three decades by "making searches of all records" for a general history of the Navy.[1] Pepys' archival project convinced him the providential vessel had been preternaturally resistant to decay. Surviving public archives like those this naval administrator studied and assembled appeared as integral parts of early modern enterprises of state power and governmental performance. The aim here is to highlight the value of that scriptural craft as figure both of practical navigation and of goods' cataloguing and maintenance, an association of pressing concern in the very epoch where global links and the fate of accumulation and display in exhibits and museums seemed newly troublesome.

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[1] Samuel Pepys, *Naval Minutes*, ed. J.R.Tanner (London: Navy Records Society, 1926), 205; Kate Loveman, *Samuel Pepys and his Books: Reading, Newsgathering and Sociability 1660-1703* (Oxford: Oxford University Press, 2015), 130-1.

When there's a threat of a deluge, an ark's a good place to find your self. My very first experience behind the scenes at a museum was back in summer 1974, well over four decades ago, as an unpaid intern in the Navigation department of the National Maritime Museum in Greenwich. My hosts and superiors were then Alan Stimson, veteran of the Blue Funnel Line turned astrolabe expert, and Christopher Terrell, former naval officer and maritime chart obsessive. Alan had me take a Polaroid camera around the maritime instrument collection, pasting instant and somewhat sticky photos of the sextants and mariners' astrolabes onto catalogue cards. Christopher typically got me to make sure that every single sheet of Joseph Des Barres' *Atlantic Neptune* (1774-77), the great and costly colonial survey of the coasts from Newfoundland to New York, was in its proper order and easy of access. The two curators would later publish remarkable studies of these materials.[2] I learnt fast how much of museum work was archival, and how much storage and classification mattered to the maintenance and use of these great maritime collections. Part of the aim of this paper, its concern with material techniques and labours of the classifier, is to insist on the pressing and indispensable interdependence of archives and of collections, especially when both are involved in exchanges across boundaries of mutual difficulty.

So it seems apt here to reflect slightly more broadly on how memories and maritime displays, arks and archives, perform their equivocal work. The unfortunate wordplay in this essay's title exploits the homophony of the terms for the casket (L *arca*) in which rare and precious goods were stored, and for forms of rule (G *archē*), hence the office where state records were preserved. In his reflexions on order of knowledge in the classical age of seventeenth- and eighteenth-century Europe, Michel Foucault's confessedly "playful etymology" with *archē* prompted his archeology of the archive. The archive was to be seen as a set of relations of transformation and displacement, not so much traces somehow saved from the flood, but rather principles governing their retention and destruction. The proposal was to consider past facts of discourse not as documents but as what were to be understood as "monuments" to be excavated from diluvium. Stories of the Ark, it is suggested here, helped nourish these principles and guide techniques of memory and conservation, especially in moments of encounter with apparently exotic or ancient worlds where different archival regimes were in question.[3]

In what follows, some significant moments in the classical age are selected to bring out ways in which the Ark was used to place equivocal objects in their properly archival sequence within appropriate antiquarian histories of technique and culture: enterprises of naval management associated with Samuel Pepys in later seventeenth-century London studied variations in ship design across the globe; the entry of British vessels into the Pacific under the command of James Cook and his successors confronted the challenging material traces of Polynesian navigational skill and

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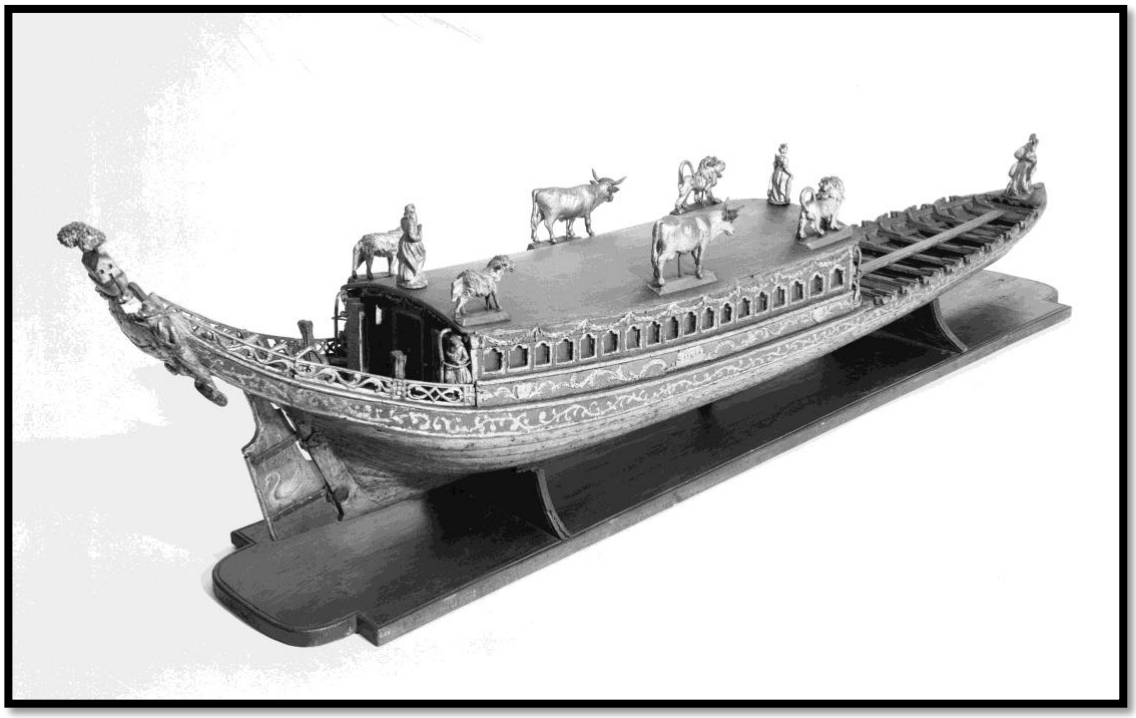
[2] Richard Dunn, "Collecting and Interpreting Navigation at Greenwich," in W.F.J.Mörzer Bruyns, *Sextants at Greenwich* (Oxford: Oxford University Press, 2009), 72-82; Christopher Terrell, "The Magnificent *Atlantic Neptune*." *Geographical Magazine* 53 (1981): 956-61; Stephen J. Hornsby, *Surveyors of Empire: Samuel Holland, J.F.W. Des Barres and the Making of the Atlantic Neptune* (Kingston: McGill-Queen's University Press, 2011).

[3] Michel Foucault, "Réponse au Cercle d'Épistémologie," *Cahiers pour l'Analyse* 9 (1968): 19; Carolyn Steedman, *Dust* (Manchester: Manchester University Press, 2001), 69; Lorraine Daston, "Third Nature," in *Science in the Archives: Pasts, Presents, Futures*, ed. Lorraine Daston (Chicago: University of Chicago Press, 2017), 11-12.

material culture; and in exchanges between the East India Company and the Qing regime in the 1790s the very status of European and Chinese development was registered in puzzling images of goods presented in gift and tribute.

The trope of Noah's Ark survived impressively through the imperial meridian at the classical age's end. In each of these cases, it was used to make sense of past developments and current predicaments of encounter through interpretations of records that often gave ambiguous meanings to objects and techniques in movement. It's true there's not now much of Noah in most maritime museums. No state collection has yet lent credence to the search for extant relics of the biblical vessel, a project inevitably named by devotees (and some skeptics) "Arkeology".[4] On the other hand, holdings of the National Maritime Museum do display the heraldic importance of the Ark in the self-image of metropolitan shipbuilding, evident in medals, glass and jugs, notably in the magnificent replica of the ceremonial barge of the Worshipful Company of Shipwrights (motto: "within the Ark safe forever"), made in around 1780, its roof adorned with pairs of gilded lions, bullocks and sheep, as well as of Noah and his wife.[5]



Model of the ceremonial barge of the Worshipful Company of Shipwrights circa 1780. Brass, gilt and wood, 3 feet in length. On the cabin roof are figures of lions, bullocks, sheep, Noah and his wife. National Maritime Museum SLR0544.

[4] Larry Eskridge, "A Sign for an Unbelieving Age: Evangelicals and the Search for Noah's Ark," in *Evangelicals and Science in Historical Perspective*, ed. David N. Livingstone, D.G.Hart and Mark A.Noll (New York: Oxford University Press, 1999), 244-66; James S. Bielo, *Ark Encounter: the Making of a Creationist Theme Park* (New York: New York University Press, 2018).
[5] National Maritime Museum, Caird Collection, SLR0544.

The Ark then neatly combined several features of maritime economy and society it seemed important to connect in early modernity: national and religious salvation through providential mastery of navigation, a religious origin for the principles of ship design and the crucial role of natural historical and mathematical knowledge in assembling great collections and assuring their survival. Learned analysis of the construction, population and fate of the Ark was used to make sense of accumulation, memory and materiality in early modern erudition.[6]

The Ark's builders apparently faced familiar curatorial puzzles to those of more recent collections – where to get material for packing cases and storage systems; where to stash oversize items; how to conserve collections always vulnerable to decay; what to include in limited space. These were juxtaposed with less commonplace questions, such as how to provide enough herbivores as food for the carnivores, so that sufficient breeding pairs of both kinds would be left at the end of the Deluge, or, more worryingly, whether fish were capable of sin, in which case shipboard aquaria would have to be provided to preserve them alive from the consuming flood.[7]

Thus the Ark became a way of archiving the divine and practical roots of shipbuilding and navigation. It was so treated at the head of Samuel Purchas' 1625 global survey of missionary and commercial voyages, *Hakluytus Posthumus*, a work highly important both for the assertion of a Protestant British lineage for maritime history and for its influence on collectors and maritime writers such as John Wilkins, John Evelyn and Samuel Pepys. The topos of the Ark as complex technical and providential reflection on practical design in writers such as Purchas was no doubt later somewhat obscured by his texts' salient role in Romantic appropriations of oriental myth and poetics.[8] For Purchas, the question of the Ark, like all issues of navigation, focused partly on polemics with the Dutch, pre-eminent European commercial and military maritime power. In 1604 a wealthy Dutch merchant Peter Janszoon commissioned a ship with the same dimensions as the biblical Ark, concluding it could not cope with small crews nor with long voyages, but could carry great cargoes. The Ark appeared in similarly material and historical guise in the masterly treatise by the Delfshaven shipbuilder Cornelis van Yk, *Dutch shipbuilding unveiled*, which treated the Ark as a problem in maritime economy, the original geometrical form of a long series of experimental ship designs evident in European and Asian cultures.[9] Well into the eighteenth century, in successive universal histories and keys to comparative mythology, as well as in conjectural genealogies of maritime construction and navigational art, it was argued that Noah was at the very least a most competent shipbuilder. This was, as example, the claim of the curate and orientalist

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[6] Jim Bennett and Scott Mandelbrote, *The Garden, the Ark, the Tower, The Temple: Biblical Metaphors of Knowledge in Early Modern Europe* (Oxford: Museum of the History of Science, 1998), 73-5.

[7] Don Cameron Allen, *The Legend of Noah: Renaissance Rationalism in Art, Science and Letters* (Urbana: University of Illinois Press, 1963), 71-81.

[8] Samuel Purchas, *Hakluytus Posthumus, or Purchas his Pilgrimes* (1625; repr. Glasgow: James Maclehose, 1905-7), 20 vols., 1:xxxvi, 3-6; L.E.Pennington (ed.), *The Purchas Handbook: Studies of the Life, Times and Writings of Samuel Purchas* (London: Hakluyt Society, 1997), 7, 10; Nigel Leask, "*Kubla Khan* and Orientalism: the Road to Xanadu Revisited," *Romanticism* 4 (1998): 1-21.

[9] Richard Unger, *The Art of Medieval Technology: Images of Noah the Shipbuilder* (New Brunswick: Rutgers University Press, 1991), 133-4; Cornelis van Yk, *De Nederlandsche Scheeps-bouw-konst Open Gestelt* (Amsterdam: Jan ten Hoorn, 1697), 2-5.

Thomas Maurice, sometime librarian at the British Museum, who in 1795 made Noah a rational adept "acquainted with the principles of naval architecture and navigation": "it cannot reasonably be supposed that every plank was laid and every joint fitted by immediate inspiration."[10]

The Ark was also and in a connected manner taken to be the exemplary catalogued collection, an embodiment of the principles of tabular order that dominated the classical age's natural histories. In Paris in 1644, Evelyn saw a "shop called Noah's Ark, where are sold all curiosities, natural or artificial, Indian or European, for luxury or use".[11] The catalogue of Oxford Botanic Garden boasted in 1658 that "as all creatures were gathered into the Ark, comprehended as in an epitome, so you have the plants of this world in microcosm in our garden."[12] The Lambeth museum of John Tradescant senior and junior, celebrated gardeners and collectors, travelers in Africa and the Americas, stocked with curiosities from round the world and catalogued in print in 1656, was known simply as "the Ark". Ultimately it furnished one of the first purpose-built public museums, Oxford's Ashmolean in 1683. A scurillous royalist verse (1651) refers to "Tredeskin and his Ark of Novelties"; while a discussion of automata and curious marvels at the end of 1661 in the Welsh divine Thomas Powell's book on *Humane Industry*, a survey of useful arts such as printing, clockmaking and the compass, evoked celebrated attempts "to preserve all rarities", significantly placing "John Tredeskin's *Ark* in Lambeth" alongside "the *Archives* of sundry Princes and private persons."[13]

The Ark thus became a byword for systems of information management more generally, the ideal type of an archive. This was not solely a reflexion on the virtues of preservation of fragile specimens of life from hostile threat. It also underwrote the claim that the exhaustive collection was also a path to redemption through the reconstruction of creation. Seventeenth century scholars such as John Wilkins in London and Athanasius Kircher in Rome identified their study of the population of the Ark with schemes for the overhaul of classification schemes, languages and museums so that a virtuous and perfect order could be recovered from chaos and its survival guaranteed.[14] Baroque scholars already bewailed the flood of matters of fact, in print and image, which threatened to overwhelm the world of learning and culture. Mechanized arks could allegedly handle big data.

In 1639 the Oxford scholar and keen royalist Thomas Harrison proposed an "ark of studies" (*arca studiorum*), an ingenious and complex system of storing and indexing notes from across erudite literature, as an example of what Noel Malcom has called "the physical technologizing of knowledge", seeing in such arks a combination of the desire to bring the whole world together in a manageably small space and to generate

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[10] Thomas Maurice, *History of Hindostan* (London: for the author, 1795-99), 3 vols. 1: 437.
[11] John Evelyn, *Diary*, ed. Austin Dobson (London: Macmillan, 1906), 3 vols., 1:76 (3 February 1644).
[12] Richard Drayton, *Nature's Government: Science, Imperial Britain and the 'Improvement' of the World* (New Haven: Yale University Press, 2000), 9.
[13] Bennett and Mandelbrote, *The Garden,* 88; Thomas Moisan, "Herrick, Hollar and the Tradescants: Piecing Together a Seventeenth-Century Triptych," *Criticism* 43 (2001): 315-17; Thomas Powell, *Humane Industry, or a History of Most Manual Arts Deducing the Original, Progress, and Improvement of Them* (London: Henry Herringman, 1661), 187.
[14] John Wilkins, *An Essay Towards a Real Character and a Philosophical Language* (London: Samuel Gellibrand and John Martyn, 1668), 164; Athanasius Kircher, *Arca Noe* (Amsterdam: Jan Jansson, 1675), 108-10; Allen, *Legend of Noah*, 185-7.

novel systems from a finite set of individual units. The Jesuit museum manager Kircher also manufactured small-scale *arcae,* or *cistae,* ingenious wooden boxes that let their users calculate, send messages, design buildings and compose music. Pepys owned one, and it survives in his library in Cambridge.[15] The trope of the ark, in a significant prefiguration of online technologies, nourished the capacity to reduce and manage with ingeniously embodied hardware a potentially universal world of form and meaning.

The Ark thus became a kind of heterotopia, a place set deliberately apart that allowed otherwise scattered and troublesome entities to be brought together for analysis, preservation and display that could in some manner correct the ills of its host culture: mathematical calculation, antiquarian erudition and natural historical wonder, skilful workmanship and ingenious classification. The Ark was in all these senses of much interest to Pepys, indefatigable cataloguer, curious collector and enthusiastically efficient naval administrator. Important was Pepys' fascination with the work of John Wilkins, whose 1668 *Essay towards a real character* launched its programme for a universal language where signs would at last match things, as they had done in Eden, with a detailed survey of the Ark's living cargo. It was of course in a comment on Wilkins' *Essay* that Jorge Luis Borges concocted the taxonomic absurdities of a Chinese encyclopaedia that in turn prompted Foucault's comment on alien classification at the start of his archeological study of the archival system of the classical age.[16] Before one could make a system of universal signs, one had to know what things there were in the world: and before that task could be completed, it was necessary to catalogue the Ark.[17] This enterprise, for a set of universal standards of measure and of sense, much appealed to Pepys. In June 1666, while awaiting news of a great sea battle against the Dutch, he brought the natural philosopher Robert Hooke back to his house and passed on from his maritime archive "some of my tables of naval matters, the names of rigging and the timbers about a ship, in order to Dr Wilkins' book coming out about the Universal Language." He heard Wilkins himself talk of the plans, bought the book in May 1668 as soon as it appeared, then got his servant to read him passages from the work, "particularly about Noah's Ark, where he do give a very good account thereof, shewing how few the number of the several species of beasts and fowls were that were to be in the Ark, and that there was room enough for them and their food and dung, which do please me mightily and is much beyond what ever I heard of the subject, and so to bed."[18]

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[15] Noel Malcolm, "Thomas Harrison and his 'Ark of Studies': An Episode in the History of the Organization of Knowledge," *The Seventeenth Century* 19 (2004): 217; Mara Miniati, "Les *Cistae Mathematicae* et l'Organisation des Connaissances au XVIIe Siècle," in *Studies in the History of Scientific Instruments*, ed. Christine Blondel, Françoise Parot, Anthony Turner and Mari Williams (London: Turner Books, 1989), 43-51; John Fletcher, "Athanasius Kircher and his *Musurgia Universalis*," *Musicology Australia* 7 (1982): 73-83.

[16] Jorge Luis Borges, "The Analytical Language of John Wilkins," in *Other Inquisitions* (Austin: University of Texas Press, 1964), 103; Michel Foucault, *The Order of Things: an Archaeology of the Human Sciences* (London: Tavistock Publication, 1970), xv-xvi.

[17] Tony Davies, "The Ark in Flames: Science, Language and Education in Seventeenth-century England," in *The Figural and the Literal: Problems of Language in the History of Science and Philosophy 1630-1800*, ed. Andrew Benjamin, Geoffrey Cantor and John Christie (Manchester: Manchester University Press, 1987), 83-5; James Dougal Fleming, *The Mirror of Information in Early Modern England: John Wilkins and the Universal Character* (London: Palgrave Macmillan, 2017), 257-63.

[18] *Diary of Samuel Pepys*, ed. Robert Latham and William Matthews (London: Harper Collins, 1971-83), 11 vols., 7:148 (4 June 1666) and 9:215 (27 May 1668).

Pepys understandably found Wilkins' Ark fascinating as a model of a transient but robust maritime ecosystem. He scoured his archives for information about the Ark in relation to the calculations of timber and shipuilding. The seventeenth century Dutch shipuilder van Yk, whose work Pepys owned, used the Ark as a test for geometrical theories of hull design. Many illustrated versions of Scripture showed in detail how shipwrights worked on timber in antediluvian (and modern) yards, confirming the role the Ark played in making sense of the practice and transmission of such maritime skill.[19] Pepys was obsessed with the accurate geometrical practices of timber measurement. He was professionally charged with managing estimates of timber for naval stores; and personally concerned with the right choice of timber for oak book presses for the books and records in his library. He learnt timber gauging from London mathematics teachers, interviewed timber merchants on the right kind of Baltic supplies and trained in sawing and cutting, visited nearby forests to see how fraudulent agents scammed the Navy Board, and sat in pubs chatting up mariners, shipwrights and timber yard owners on their customs of woodcraft and crime.[20] Along the way he got to know both the elderly mathematics teacher Henry Bond, who taught him timber measurement, and spent time with Peter Blackborow, a timber supplier who invited the clerk to his garden, fed him peaches and apricots, chatted about measurement, but failed to convince Pepys entirely of his honesty: "he has not dealt well with us," the diarist noted.[21]

Significant, too, was the fact that in the 1670s Bond and Blackborow would engage in a fight about using compass variation to determine longitude at sea, Pepys subsequently acquiring their works for his own archive. London communities of ship builders, woodworkers and mathematicians were already much concerned with this issue and it would lead soon to the establishment of the Royal Observatory at Greenwich in 1675 partly in response to Bond's projects.[22] In matters of ship design and the Ark, Pepys' principal informant was his friend the erudite naval engineer and FRS Henry Shere, expert in the construction and demolition of Britain's failed colonial scheme at the Tangier harbour fortifications in the 1670s and 1680s. Pepys was impressed that such a great vessel as the Ark had been built by Noah's small family without apparently attracting curiosity or jealousy from those who would be left behind (since such public passions were all too obvious in Restoration navy yards). Pepys chatted with Shere about how long it might take to build such a huge ship and noted that it was scandalous that his own contemporary shipbuilders had failed to caulk naval vessels with pitch since Noah had obviously done so.[23]

Even more significantly, Pepys, Shere and their colleague the ingenious and ambitious natural philosopher and mathematician William Petty, then much concerned with his double-bottomed catamaran scheme for a newfangled ship design, discussed how in the aftermath of the universal deluge ship designs had then evidently

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[19] Unger, *Art of Medieval Technology*, 131-4, 140-2.
[20] James Raven, "Managing Timber: How Pepys Measured Up," *Magdalene College Magazine* 55 (2010-11): 70-77.
[21] *Diary of Samuel Pepys*, 3:105 (9 June 1662), 165 (15 August 1662).
[22] E.G.R.Taylor, "Old Henry Bond and the Longitude," *Mariner's Mirror* 25 (1939): 162-9; David Bryden, "Magnetic Inclinatory Needles Approved by the Royal Society?" *Notes and Records of the Royal Society* 47 (1993): 17-31; Richard J. Howarth, "Henry Bond's Predictions of the Change in Magnetic Declination in London," *Annals of Science* 59 (2002): 391-408.
[23] Pepys, *Naval Minutes*, 153, 206.

varied and adapted to local conditions. Surely, they asked, had the Ark set the pattern of shipbuilding ever after one would expect a uniformity of design; but, instead, across the world hulls were cunningly adapted to wind and weather, timber and tide, "as by time and practice some nations do become more knowing in naval architecture their form of built provides for the answering more of these accidents." There was an even more striking equivocation about Noachic ship design and the doctrine of postdiluvian diffusion: the most primitive societies, so Pepys and Petty reckoned, had the best hulls, thin canoes well suited to movement through water. Petty's designs for double hulls, it has sometimes been alleged, were in part inspired by those of Tamil vessels in the Indian Ocean. Spectacular examples, so Pepys noted in his naval archive, were Inuit (Greenland) and East Asian (Indian) boats, "which seem of all others to be least answered in the form described by Moses of the Ark."[24] Thus an entire range of issues central to early modern maritime and museological culture were in play around the Ark and its archive: the applicability of sophisticated mathematics to hull design; the transmission of skill in shipbuilding and related arts, such as husbandry and astronomy, navigation and magnetism; the capacity of collectors to master the contents of the living world, to classify, preserve, display and manage the loot of conquest; and indeed the major puzzle of the technological sophistication of otherwise apparently primitive cultures in the Atlantic and eastern oceans.

The issues embodied in debates about the Ark and its archive certainly intensified during the eighteenth century, as major collections of global loot were accumulated in the European metropole and overseas plantations militantly expanded. British and French entry into the Asia-Pacific region raised fundamental issues about diffusion, technology and skill. Questions of institutional memory and inventory became newly and intensely pressing. The utility and significance of the Ark as organisational principle did not, therefore, wane in the epoch of exploration and enlightenment, but was reorganised and intensified from the later eighteenth century on. Meanwhile, as several historians of British imperial ambitions and frustrated information panics have demonstrated, the figure of the idealised archive came to dominate romantic fantasies of long-range control over alien subjects.[25]

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[24] Pepys, *Naval Minutes*, 207-8; Donal Flood, "William Petty and the Double Bottom," *Dublin Historical Record* 30 (1977): 96-110; Frances Harris, "Ireland as a Laboratory: the Archives of William Petty," in *Archives of the Scientific Revolution*, ed. Michael Hunter (Woodbridge: Boydell, 1998), 73-90.

[25] C.A.Bayly, *Empire and Information: Intelligence Gathering and Social Information in India 1780-1870* (Cambridge: Cambridge University Press, 1996); Thomas Richards, *The Imperial Archive: Knowledge and the Fantasy of Empire* (London: Verso, 1993), 16-32; James L. Hevia, "The Archive State and the Fear of Pollution: from the Opium War to Fu-Manchu," *Cultural Studies* 12 (1998): 234-64.

"The Manner how the Whole Earth was Peopled by Noah and his Descendants after the Flood". Engraving first published in Universal Magazine of Knowledge and Pleasure*, vol. 4, no. 28 (June 1749). 19x25 cm. The print was owned by the antiquarian collector Sara Sophia Banks, sister of Joseph Banks, and presented to the British Museum by his wife Dorothea. British Museum Y.4.103.*

On the one hand, the Ark was an apt and provocative trope for dealing with the central issue of the fragile and invaluable floating systems on which many of the new colonial economic networks spread worldwide increasingly relied. As Patricia Seed has demonstrated, while the Dutch made maps and the Portuguese made astronomical observations to show their ownership, British systems of colonial possession adopted in the settlements of the New World frequently relied on the activity of gardening. *Plantation* was thus a key term in colonizing projects. The custom was notoriously carried on at the new penal colony at Sydney in 1788, where planting nine acres of corn was taken to be a sign of possession. [26] But despite the efforts of authorities such as the eighteenth-century British naturalists Joseph Banks, John Ellis, John Bartram or John Fothergill, such transplantation was always unreliable, its success uncertain and variably dependent on very local circumstances. James Cook's planting in Tahiti in

[26] Patricia Seed, *Ceremonies of Possession in Europe's Conquest of the New World, 1492-1640* (Cambridge: Cambridge University Press, 1995), 29-31; Jeannette Hoorn, *Australian Pastoral: the Making of a White Landscape* (Fremantle: Fremantle Press, 2007), 17.

1769 of seeds obtained from James Gordon's Mile End nursery has been polemically compared with Noah's Ark as emblem of global imperium: Nigel Rigby rightly warns us against too hasty such an identification, as though economic botany and transplantations were effortless systems of world settlement.[27]

Eighteenth century naturalists and navigators well knew the difficulty of emulating Noah's triumph. Hans Sloane's iguana leapt overboard and drowned when frightened by sailors, mariners ate John Bartram's carefully collected tortoises.[28] Banks told the gardener on Bligh's breadfruit voyage that "as you have been bred a gardener, and know the proper proportion of air, water, light, shade, warmth, shelter etc that plants require, I shall pass over all such matters, and confine myself to the particulars in which a garden on board ship requires a different treatment from that of a garden on shore."[29] Transport on these "floating greenhouses" was difficult but crucial, not least because specimens' survival and fate helped determine what it was reckoned the world contained.[30] Inventory sciences were closely entangled with models of the diffusion and plantation of hosts of living specimens whose transport was always fraught. Many fights broke out around rival assessments of natural specimens and indigenous artefacts shipped between America, the Pacific and the European metropole.

On the other hand, as in the conversations between Pepys, Shere and Petty, so in the later eighteenth century the Ark continued to be used a spur for major debates about the long-term distribution of techniques and social customs worldwide since immemorially ancient times. Jesuit experts at the Qing court, such as the French missionary Dominique Parrenin, explicitly traced the obvious sophistication and longevity of Chinese arts and techniques to their origin with Noah. He explained in 1740 that Chinese knowledge and use of iron was of immense antiquity; that this demanded knowledge of smelting ore; and that "perhaps they had with them some fragments of this metal, or they'd learnt to recognize it from those who lived with Noah; because it's scarcely credible that the patriarch built the Ark without the help of any iron tools."[31] British scholars and travelers agreed that what was apparent in contemporary Chinese technical and political sophistication must descend quite directly from the Ark. The mythological culture hero Fu Xi, imagined as exercising the powers of Emperor of the Middle Kingdom about 2800BCE, founder of Chinese arts and letters, was commonly identified with Noah himself. The wisdom of Qing polity, its distinction and isolation from all other nations, and especially its culture's

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[27] Gananath Obeyesekere, *The Apotheosis of Captain Cook: European Mythmaking in the Pacific* (Princeton: Princeton University Press, 1992), 12-13; Nigel Rigby, "The Politics and Pragmatics of Seaborne Plant Transportation, 1769-1805," in *Science and Exploration in the Pacific: European Voyages to the Southern Oceans in the 18th Century*, ed. Margarette Lincoln (Woodbridge: Boydell, 1998), 83-4.

[28] Hans Sloane, *A Voyage to the Islands Madera, Barbados, Nieves, St Christophers and Jamaica, volume II* (London: for the author, 1725), 346; Christopher M. Parsons and Kathleen S. Murphy, "Ecosystems under Sail: Specimen Transport in the Eighteenth-Century French and British Atlantics," *Early American Studies* 10 (2012): 527.

[29] Banks to Wiles, 25 June 1791, in *The Letters of Joseph Banks: a Selection*, ed. Neil Chambers (London: Imperial College Press, 2000), 135.

[30] Dulcie Powell, "The Voyage of the Pant Nursery HMS *Providence* 1791-1793," *Economic Botany* 31 (1977): 367-431.

[31] Parrenin to Dortous de Mairan, 20 September 1740, in *Lettres Édifiantes et Curieuses des Jésuites de Chine 1702-1776*, ed. Isabelle and Jean-Louis Vissière (Paris: Éditions Desjonquères, 2001), 204.

remarkable and early skill in arts and techniques, were taken by European admirers as evidence for this direct link with the Ark.[32]

The British Museum archivist Thomas Maurice argued that Noah had been archivist of the sciences, transmitting astronomical and scientific learning to posterity. "All the precious remains of antediluvian science were with Noah and his sons in the Ark; possibly not inscribed on tablets of stone or brass; but certainly engraved still deeper upon the hearts of the survivors." It was obvious to these later eighteenth century British scholars that Noah had stellar astronomy, the arts of shipbuilding, knowledge of the magnetic compass. It was obvious, too, that he and his science had somehow been there already in ancient China. Noah had allegedly founded Chinese civilisation, it had subsequently declined, but its common roots would make trade and exchange viable and productive.[33] When, under Joseph Banks' encouragement, the East India Company launched an embassy in 1793 to the Qing court to encourage exchange of contemporary British goods for precious Chinese tea, these issues of encounter and ambiguity would become peculiarly salient. One East India Company writer commented that "how the Chinese could understand Astronomy 4000 years ago is wonderful," adding that the relation between their astral science and their imperial claims to "supremacy of the Globe" should best be understood as a diplomatic fiction, akin to the romantic claims of British monarchs to dominion over France. The use of scriptural and cosmological fantasy had important tendencies to destabilise confidence in cross-cultural comparison.[34]

Noah had apparently managed to stop time, by preserving materials and species, techniques and culture, otherwise lost and decayed. He had then transmitted to his progeny a range of skills and forms of knowledge that could be used, in principle, to calibrate the level of social and historical development of all the world's cultures. This is why the combination of the Ark's natural historical archive and the technical achievements it embodied were so vital for making sense of history and the measure of time, preserving and altering the order of history. Consider a pair of examples to illuminate these twin functions of the relation between Ark and archive. In the former case, the Ark as an archival system of goods, the fate of collections of goods taken between Britain and Polynesia during the period of Cook's voyages shows that encounters could transform what cargo meant and its highly equivocal significance. In the latter case, in which the Ark was understood as an archival history of culture origins, the representation of collections of goods taken on behalf of the East India Company between Britain and China during Lord Macartney's embassy shows how equivocal were attempts to define the past and current state of those cultures in contact.

Bernard Smith influentially suggested that "in the Pacific Cook had to play at being as best he could Adam Smith's god," imposing laws of market commodities where their

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[32] Samuel Shuckford, *Sacred and Prophane History of the World Connected*, 3rd ed., 2 vols. (London: Tonson, 1743), 1:102; *The Modern Part of an Universal History, volume VIII* (London: Richardson, 1759), 320-5.
[33] Maurice, *History*, 1:262.
[34] Peter J. Kitson, *Forging Romantic China: Sino-British Cultural Exchange 1760-1840* (Cambridge: Cambridge University Press, 2013), 134-43; James Cobb, "Sketches respecting China and the embassies sent thither" (1792), British Library, India Office Records, MS G/12/20 fols. 42, 97.

writ did not run.[35] The status of the goods shipped to and from the Pacific was therefore very much in question, certainly not always well defined by inventories and archives. The fragility and difficulty of shipment helped make their sense equivocal, as responses in Britain and in Polynesia amply demonstrated. In July 1774, a satirical note in the opposition *Westminster Magazine* offered "strictures on the late adventures to the South Seas." In comparison with the great conquests of Spanish voyages, the *Magazine* denounced the results of Cook's two recent Pacific voyages as generating nothing but "collections of trifles": "numbers of our hardy subjects have died on the passage and a great expence the nation hath been put to; and only to bring home a few seeds, some shells, stuffed fish, dried birds, voracious animals, pressed plants, and an Indian," a reference to the dispossessed Raiatean landowner Mai, who'd reached London on board Tobias Furneaux's *Adventure* that month. To London journalists, comparison with the Ark seemed obvious: "at this present writing we have as great a variety as Captain Noah had in his long ship, and more in number, though they are not in pairs, and I believe philosophers in general allow that marine gentleman to have had the greatest live-stock on board his vessel that ever any sailor went to sea with."[36]

The relation between this image of the Ark and the inventory of its cargo was often used to illuminate the shifting and complex status of commodities in the world of British and Polynesian circulation. Polynesians avidly collected European materials while European mariners sought indigenous artefacts. According to a mariner on Bligh's *Providence* at Tahiti in 1792, "though very profitable to them, the natives laughed at the avidity with which we coveted all their household and other goods. Yet have they at O'tahytey their Collectors, and their cabinets of European curiosities." [37] In letters both to Banks and to his naval patron John Montagu Earl of Sandwich, Cook himself described *Resolution*, overstocked with an entire menagerie, as a Noah's Ark, "wanting but a few females of our own species." When the vessel entered Queen Charlotte Sound in February 1777 with Mai on board on his return voyage to the Pacific, the Welsh surgeon David Samwell reckoned the British vessel "might be called a second Noah's Ark." Its variegated cargo astonished the Maori, "who had never seen Horses or Horned Cattle before; these being all feeding and diverting themselves about the tents familiarised the savage scene and made us almost forget that we were near the antipodes of old England among a rude and barbarous people."[38]

The circumstance of the encounter was telling, as Anne Salmond has pointed out, because this was the first return of Cook's ships to the Sound since fatal events in late 1774 when crewmen from *Adventure* had been killed by Maori. Cook feared that Mai's presence and the return of his ships might convince the Islanders that they had

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[35] Bernard Smith, *Imagining the Pacific: in the Wake of the Cook Voyages* (New Haven: Yale University Press, 1992), 209.

[36] "Momus or the Laughing Philosopher – No. XX," *Westminster Magazine* (July 1774): 347-8; Harriet Guest, "Ornament and Use: Mai and Cook in London," in *A New Imperial History: Culture, Identity and Modernity in Britain and the Empire, 1660-1840*, ed. Kathleen Wilson (Cambridge: Cambridge University Press, 2004), 149-50.

[37] Jennifer Newell, *Trading Nature: Tahitians, Europeans and Ecological Exchange* (Honolulu: University of Hawai'i Press, 2010), 43.

[38] Cook to Banks, 26 November 1776, in J.C.Beaglehole, *The Life of Captain James Cook* (Palo Alto: Stanford University Press, 1974), 511; David Samwell, 13 Februay 1777, in J.C.Beaglehole, *The Voyage of the Resolution and the Discovery 1776-1780* (Cambridge: Cambridge University Press, 1967), 995.

come back for revenge. In the event, encounter and trade took over. Samwell recorded that the price of Maori artefacts had risen remarkably: "every one was so flush of Trade that they sold their Instruments of War & every thing they brought to Market at a very high price."[39] Back in London, Samwell was courted by enthusiastic naturalists and entrepreneurs, sold much of his own collection at auction in 1781, while claiming that Joseph Banks had monopolised most of the materials gathered on the voyage. In such collections, the challenges of scope, of order and of meaning were closely entwined: too many things, too hard to classify, with different senses in different cultures. It was persistently important to integrate Ark and archive, yet increasingly hard to do so.[40]

The high status objects offered to Cook and his fellows in Polynesia may have been designed better to integrate the British into carefully woven Polynesian networks of temporality and sociability. But they were deeply equivocal. As a voyager with Cook in the South Seas in the 1770s, the radical philosopher Georg Forster straightforwardly assumed that Polynesian taste for certain goods was but a version of occidental consumerism, rather than a key aspect of different islanders' cosmologies. Forster earned a living across Europe by marketing these Pacific goods to wealthy patrons. The Tuscan Grand Duke was offered Tahitian tapa cloth from which to make garments, alongside herbaria, weapons, carvings, and tools.[41] It's worth reflecting on the ways in which European and Oceanic artefacts found themselves juxtaposed and, by implication, connected in the metropolitan showrooms: these were precisely the sites where questions whether different cultures were at the same temporal stage of development were worked out and defined. It was reported that Mai had sought resources from British armaments and instruments to reclaim Raiatea from its Borabora conquerors. Banks provided him with an electrical machine, a cynosure of up-to-date enlightened and showy instrumentation designed to impress primitive audiences. Mai's accumulation of London goods and their fate when he returned with Cook to Polynesia in 1777 was much discussed by analysts of social progress and its vagaries, such as Forster. Just as in 1774 the *Westminster Journal* damned the useless triviality of the goods brought from Polynesia with Mai, so other journalists remarked on the inutility and triviality of these European artifacts that went back to the South Seas with him.[42]

This was by no means the only telling chronological juxtaposition of Polynesian material culture with scientific and philosophical hardware. In London, "natural and artificial curiosities lately brought home with Omia [Mai]," including Maori *patu*, Tongan wooden pillows, Tahitian bark cloth and "a curious dress of Omia as

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[39] Anne Salmond, *The Trial of the Cannibal Dog: Captain Cook in the South Seas* (London: Penguin, 2004), 312-15; Beaglehole, *Voyage of the Resolution*, 995.
[40] Adrienne Kaeppler, *Artificial curiosities* (Honolulu: Bishop Museum, 1978), 38, 40; Nicholas Thomas, "David Samwell, Pacific ethnographer and historian," in David Samwell, *The Death of Captain Cook and other Writings*, ed. Martin Fitzpatrick, Nicholas Thomas and Jennifer Newell (Cardiff: University of Wales Press, 2007), 41-57.
[41] Ruth Dawson, "Collecting with Cook: the Forsters and Their Artifact Sales," *Hawaiian Journal of History* 13 (1979): 13-14.
[42] Michelle Hetherington, *Cook and Omai: the Cult of the South Seas* (Canberra: National Library of Australia, 2001), 3; Jocelyn Hackforth-Jones, "Mai/Omai in London and the South Pacific," in *Material Identities*, ed. Joanna Sofaer (Oxford: Blackwell, 2007), 20; Harriet Guest, *Empire, Barbarism and Civilisation: Captain Cook, William Hodges and the Return to the Pacific* (Cambridge: Cambridge University Press, 2007), 149-59.

represented in his print," were all put on show at Christopher Pinchbeck's Repository.[43] Time-scales marked by these artefacts mattered. Pinchbeck was a celebrated London clock maker, a master of chronometers famed for his manufacture of a Panopticon musical clock displaying half a dozen scenes of vividly automated mundane labour in shipyards and foundries, masons' yards and smithies. He presided over London's Society of Engineers and chaired a mechanics committee for the Society of Arts. It made sense to put side by side an exemplary metropolitan clock that embodied the entire range of social technologies pursued in the capital with the temporally defined devices brought from Polynesia. Pinchbeck's juxtapositions were of considerable significance for the Noachic histories enlightenment scholars produced of the diffusion of useful arts and the role of navigation in culture contact. The London show artfully combined a range of machines, balances, clocks, and mechanical models, alongside Pinchbeck's own Musical Panopticon, with the range of "artificial curiosities" from the Polynesian voyage, "the whole form'd without the use of instruments made of Iron or any Metal whatsoever by the ingenious Natives of that part of the world."[44] The Ark's progeny reached China but not the Pacific. Pinchbeck's publicity linked these artificial curiosities with Tobias Furneaux, commander of the *Adventure*, and with Mai quite directly. It also made sure to link them with his curious and pleasant "Mechanical exhibition" and thus to invite explicit comparison of the *contemporary* arts of Polynesia with the engines and mobile instruments of London.

This was by no means a straightforward nor innocent coupling, but it is eloquent about the various places occupied by the materials of navigation, technique and artifice at this conjuncture. It throws a somewhat different light on the supposedly Smithian agency of the commodity culture through which travelling goods and artificial curiosities moved around and between the Pacific and Europe in the later eighteenth century, and then allegedly allowed field scientists to move back in time when they moved out from Europe. What was juxtaposed at Pinchbeck's show or encountered together at Greenwich or Tahiti, was a set of complicated judgements of what counted as perfection of means and design, and thus of a moral purpose and a degree of social and historical development.

Very similar puzzles of social and technical development were worked out during the Macartney embassy to Beijing. In early 1792, Joseph Banks explained to the East India Company's ambassador his views on Chinese technique and its history: "the Chinese appear to me to possess the ruin of a state of civilization in which, when in perfection, the human mind had carried all kinds of knowledge to a much higher pitch than the Europeans have hitherto done."[45] In July 1793 the Qing regime greeted the embassy as a fragile vessel needing succour: "you have been blown by wind and billows and moored on our shores suffring from shortage of food and seeking safety and provisions;" in January 1794, after his failure, Macartney notoriously described

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[43] *A Catalogue and Description of a Great Variety of Natural and Artificial Curiosities…Lately Brought Home with Omia* (London, ?1774), KRO 0002 in Kroepelien Collection, Kon Tiki Museum, Oslo; Stephen Gapps, "Omai Relics from the Furneaux Collection," *Signals* 89 (2009-10): 10-15; Kaeppler, *Artifical Curiosities*, 44.

[44] Richard Altick, *The Shows of London* (Cambridge, MA.: Harvard University Press, 1978), 60, 86, 429; Liliane Pérez, "Technology, Curiosity and Utility in England and France in the Eighteenth Century," in *Science and Spectacle in the European Enlightenment*, ed. Bernadette Bensaude-Vincent and Christine Blondel (Aldershot: Ashgate, 2008), 31-34.

[45] Banks to Macartney, 22 January 1792, in *Letters of Joseph Banks*, 140.

the Qing regime as a fragile vessel needing expert captaincy, "an old, crazy, First rate man-of-war, which a fortunate succession of able and vigilant officers has contribed to keep afloat."[46] The legacy of the Ark explained both the sophistication of Chinese arts and the possibility of mastering and exploiting them. It was therefore crucial to assemble a British ark that would sufficiently impress the Qianlong emperor by exploiting what monuments were left in China from its original Noachic civilisation. Since it was acknowledged that Noah and his Chinese descendants were peculiarly devoted to celestial sciences, planetaria and globes seemed the best goods to ship. "Astronomy being a science peculiarly esteemed in China, and deemed worthy of the attention and occupation of the government, the latest and most improved instruments for assisting its operations, as well as the most perfect imitation that had yet been made of the celestial movements, could scarcely fail of being acceptable."[47]

As its principal device to ship to China, the East India Company spent £600 on a celestial clock closely resembling Pinchbeck's panopticon, a vast *Weltmaschine* constructed at the workshop of the pious Württemberg horologist Philip Matthäus Hahn, an evangelical visionary much admired both by Lavater and Schelling. The *Weltmaschine* was built in Pforzheim between 1772 and 1790 with three sets of dials to show daily, yearly and above all Biblical timescales, a system for displaying history from Creation and Flood to Apocalypse, the world's timescale dated on the machine's elegant face from the time of Adam and Noah to creation's end, an imminent if not instantly eschatological 1836. Hahn added a planetarium, a celestial globe showing more than 1500 stars and all the major planetary movements. The Company spent a further £650 for London workmen to turn the German providential machine into something they reckoned would look more Chinese, ornamented with ormolu pineapples and other exotic fruit.[48]

Timescales mediating between the archival memories of European providentialism and Qing imperial power were to serve the purposes of global trade. The arrival of these goods, the *Weltmaschine* and its scriptural chronology in pride of place, was a key moment in the fate of the Macartney embassy. The National Maritime Museum possesses what has been taken to be a magnificent representation of the event, a Chinese silk tapestry about 120 cm x160 cm.[49] Verses woven in *kesi* silk, unlike most

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[46] Aubrey Singer, *The Lion and the Dragon: the Story of the First British Embassy to the Court of the Emperor Quian Long in Peking 1792-1794* (London: Barrie and Jenkins, 1992), 15; J.L.Cranmer-Byng, *An Embassy to China: Being the Journal Kept by Lord Macartney During his Embassy to the Emperor Ch'ien-lung 1793-1794* (London: Longmans, 1962), 212.

[47] George Staunton, *An Authentic Account of an Embassy from the King of Great Britain to the Emperor of China*, 3 vols. (London: Nicol, 1797), 1:43.

[48] Alfred Munz, *Philipp Matthäus Hahn* (Sigmaringen: Jan Thorbeke, 1977), 34-38; Friedrich Schelling, *Werke 1*, ed. Wilhelm Jacobs, Jorg Jantzen and Walter Schieche (Stuttgart: Frommann Holzboog, 1976), 35-38; Angelika Müller-Scherf, "Weltmaschine" (Catalogue no. 3.02) in *Philipp Matthäus Hahn 1739-1790*, ed. Christian Väterlein (Stuttgart: Württembergisches Landesmuseum, 1989), 383-91; Henry King and John R. Millburn, *Geared to the Stars: the Evolution of Planetariums, Orreries and Astronomical Clocks* (Bristol: Hilger, 1978), 238-40.

[49] National Maritime Museum TXT0107; Cranmer-Byng, *Embassy to China*, x; Joseph Needham and Wang Ling, *Science and Civilisation in China, vol. 4: Physics and Physical Technology, part 2: Mechanical Engineering* (Cambridge: Cambridge University Press, 1965), 477, fig.662; J.L.Cranmer-Byng and Trevor Levere, "A Case Study in Cultural Collision: Scientific Apparatus in the Macartney Embassy to China, 1793," *Annals of Science* 38 (1981): 520; James L.Hevia, *Cherishing Men from Afar: Qing Guest Ritual and the Macartney Embassy of 1793* (Durham NC: Duke University Press, 1995), 177.

of the rest of the tapestry, and signed by the eighty-three year old Qianlong emperor in the top right corner, seem to identify the scene depicted on the tapestry as the arrival at the imperial court of the British embassy bearing tribute:

"For many years the Portuguese have come, presenting gifts
Now the English have arrived in all sincerity.
Their journey is akin to that of the legendary travelers Shu Hai and Heng Zhang.
The fame of our august ancestors has extended across the vast ocean.
While they appear ordinary, their hearts are good and true
Yet their gifts are not precious, but curiosities,
Whose subtleties have been exaggerated.
Still, in cherishing men from afar, no matter how meagre their offerings,
We treat them with generosity."[50]

The Macartney mission has been understood as a moment of extreme cross-cultural collision. It exerted manifold effects on romantic notions of China, not least through the archives assembled around the embassy. Those archives have long been used mistakenly to underline allegedly stark contrasts between occidental dynamism and the alleged stasis of Qing culture. The Company and the British government sought to break the Canton system of controlled trade with the Celestial Empire, especially what they saw in Adam Smith's terms as Qing "unnatural" failure to recognize any goods as commodities exchangeable for the British drug of choice.[51] The celebrated Qianlong edict robustly ruled out a permanent "red headed western ocean" resident in the imperial capital and did not contemplate changing terms of trade with these barbarians. It might be laudable that British tribute-bearing envoys had brought gifts, but the edict noted that Chinese fame had attracted many such western ocean delegations. "We already have a sufficient number of similar things." Macartney had seen them for himself. "We have never placed great value on unusual and rare things", the edict declared. "We are not eager to have you send any more that are made in your own country."[52] The tapestry seems to show something of this public condescension. It is a representation of tribute bearers, and yet has little in common with any other of the commissioned courtly images of foreign tributaries made under the Qing dynasty's campaign for imperial unification during the eighteenth century.[53]

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[50] Translation in James L.Hevia, "Diplomatic Encounters: Europe and East Asia," in *Encounters: the Meeting of Asia and Europe 1500-1800*, ed. Anna Jackson and Amin Jaffer (London: V&A Publications, 2004), 96.

[51] David Porter, "A Peculiar but Uninteresting Nation: China and the Discourse of Commerce in Eighteenth-century England," *Eighteenth-century Studies*, 33 (2000): 186-7; Leask, "Kubla Khan," 4-8; Robert Swanson, "On the (Paper) Trail of Lord Macartney," *East Asian History* 40 (2016): 19-25; Henrietta Harrison, "Chinese and British Diplomatic Gifts in the Macartney Embassy of 1793," *English Historical Review* 133 (2018): 65-97.

[52] J.L. Cranmer-Byng, "Lord Macartney's Embassy to Peking in 1793 from Official Chinese Documents," *Journal of Oriental Studies*, 4 (1957-8): 136-7.

[53] Laura Hostetler, *Qing Colonial Enterprise: Ethnography and Cartography in Early Modern China* (Chicago: University of Chicago Press, 2011), 41-49.

Silk tapestry representing an embassy bearing goods to the Chinese imperial court. In the top right is the Qianlong emperor's poem on the Macartney embassy of 1793; in the lower right are a celestial globe and an armillary sphere, images taken from Illustrated Regulations for Ceremonial Paraphernalia *(1759-66) of instruments made for the Beijing Observatory under Ferdinand Verbiest SJ in 1669-74. The first record of the tapestry, 122cm x 160cm, was its purchase for James Caird in 1933. National Maritime Museum TXT0107.*

The text of the emperor's poem woven into the tapestry's upper right is also preserved in Chinese imperial archives of the period. Qianlong's lines were read in Macartney's presence on 14 September 1793 at a ceremonial feast at Rehe (Jehol), the imperial base in Manchuria. [54] London newspapers reported that Macartney "received from the Emperor's hands a copy of verses made by himself for his Britannic Majesty in a box of great value and antiquity, made of black wood, carved very neatly. The Ambassador had also the honour to received a copy of verses for himself." Satirists were quick to imagine for themselves what cautionary doggerel might be directed from China at the errors and triumphs of British politics.[55] The imperial poem's genuine sentiments anticipated the edict issued a few days later. The British envoys

[54] Cranmer-Byng, "Macartney's Embassy," 163-4.

[55] *London Chronicle*, 76 (29-31 July 1794): 111; Thomas Jones Mathias, *The Imperial Epistle from Kien Long Emperor of China to George the Third King of Great Britain* (London: R.White, 1795), x; Laurence Williams, "British Government under the Qianlong Emperor's Gaze: Satire, Imperialism and the Macartney Embassy to China, 1792-1804," *Lumen* 32 (2013): 102-3.

were praised for sincere desire to travel so far to offer tribute: China's repute must have reached them in their remote western homeland. Macartney's deputy, the young administrator John Barrow, who would eventually rise to power as Admiralty secretary, learnt from these encounters in China just how plausible was the Jesuit view that Noah founded the Chinese monarchy and taught the arts and sciences.[56] The connexion with fabulous and ancient voyaging was thus present on both sides, in European accounts of the source of Chinese technical knowledge, in inscriptions on the *Weltmaschine* and in Qianlong's reference to legendary voyagers credited with impressive powers of travel. But the British tribute gifts were judged unimpressive. It was claimed material offered to the imperial throne by the British was unoriginal and that the tribute-bearing envoys had exaggerated their instruments' sophistication. Were these objects like those from western ocean nations already in the possession of the emperor, this would count as a major diplomatic error by Macartney and his embassy.[57]

However, the tapestry's picture of the British delegation and the goods they brought raises major puzzles: this is an equivocal object par excellence. Some take the view that the tapestry was really a depiction of an earlier, perhaps Dutch, embassy, while other scholars have dismissed the image as "anachronistic and inaccurate". The pre-eminent historian of Chinese science and technology, Joseph Needham, remarked of this tapestry that the Chinese artist was "doing his best" in his portrayal of British tribute-bearing envoys wearing "Elizabethan dress".[58] For here the British are represented as western ocean tributaries dressed in the fashion of their early seventeenth century. Only two of their instruments are visible. One is a large celestial globe, the other an equatorial armillary sphere. Neither matches any device in Macartney's inventory, certainly not Hahn's world machine. If the tapestries were made before sight of the British cargo, which included a host of machines, trade goods and models, it is telling that the only articles shown are astronomical instruments. Valued British goods such as Wedgwood pottery and Vulliamy vases and clocks, for example, are absent from the imagined procession.[59] Perhaps the tapestries were made after the inventory was available in court archives. Then the decision to represent only the British astronomical hardware of the 1790s and to show these instruments as older, more familiar, devices is equally telling.

The provenance of the images of the two instruments shown on the tapestry is not, however, in doubt. Needham already realised in the 1950s that the two pictured astronomical instruments resembled two already present in Beijing. They are illustrations taken from the *Illustrated Regulations for Ceremonial Paraphernalia*, a catalogue of ritual objects drawn up thirty years earlier between 1759 and 1766 by an imperial civil service commission. Copies of these *Regulations* were held in the Summer Palace and a major revision of the work was completed there between 1782

[56] John Barrow, *Travels in China* (London: Cadell and Davies, 1804), 433.
[57] James L. Hevia, "The Macartney Embassy in the History of Sino-Western Relations," in *Ritual and Diplomacy: the Macartney Mission to China 1792-1794*, ed. Robert A. Bickers (London: Wellsweep Press, 1993), 69-75.
[58] Hevia, *Cherishing Men from Afar*, 177 n.13; Cranmer-Byng and Levere, "Case-study in Cultural Collision," 518; Needham and Wang Ling, *Mechanical Engineering*, 477 fig. 662.
[59] Maxine Berg, "Britain, Industry and Perceptions of China: Matthew Boulton, 'Useful Knowledge' and the Macartney Embassy to China," *Journal of Global History* 1 (2006): 281-5.

and 1796, during the period of Macartney's visit. Indeed, some pages from the *Illustrated Regulations* now preserved in the Victoria and Albert Museum carry Macartney's bookplate. Thus whoever made the tapestry must have used locally familiar (and extant) astronomical devices to stand for the astronomical tribute goods brought by the British.[60] Even more significantly, these earlier devices were themselves designed by European astronomers. So the equivocal character of these goods, like those on show at Pinchbeck's showrooms, relies in large part on the reorganisation of time that was involved, a perverse redistribution of historical development with respect to the advance of technique. There was a tension between the goods that stocked the British ark and the schedules dictated by imperial archives.

The origin of the star globe and the equatorial armillary indicate the place of western ocean astronomical and navigational instruments in Qing culture. From its inauguration, the dynasty encouraged calendar reform under the counsel of Jesuit experts. The Flemish Jesuit Ferdinand Verbiest reached China in 1659 to assist with the work of the imperial Astronomical Bureau and ran the Beijing Observatory from 1669. The six-feet diameter bronze celestial sphere illustrated in the tapestry and copied from the *Illustrated Regulations* was originally made for Verbiest soon after he started managing the Observatory and was published by him in 1674. In a later report for European readers on these new machines, Verbiest described the celestial globe as "a summary of all the instruments" he designed.[61] The Greenwich tapestry's iconography of the old celestial globe and tribute-bearing envoys is thus perhaps no anachronism. Jesuit-trained missionaries stayed expert intermediaries in the period when Macartney was in China, especially at the Observatory, and several were judged hostile to British aims. Mcartney waspishly noted that "the real astronomical parts" of Qing calendrical work were managed by these missionaries, "none of them eminently qualified for the business." The Qianlong emperor had declared that the British gifts were insufficiently original or ingenious to merit special praise. A courtly iconographic decision to link British astronomical material with that of the Jesuit-managed Astronomical Office might not be delusion but judgment.[62]

But this is by no means the only reading of the tapestry that the rich archives of the National Maritime Museum allow. The object was given to the Museum as part of the founding donation from its imposing patron, the Glasgow shipping magnate Sir James Caird. His aim, expressed to the British prime minister in 1933, was to create a monument to national seaborne romance, "a Valhalla of both our naval and our mercantile maritime history."[63] The well-catalogued archive of the collection's provenance reveals that the tapestry was purchased on 5 May 1933, seemingly the

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[60] Margaret Medley, *Illustrated Regulations for Ceremonial Paraphernalia of the Ching Dynasty* (London: Han-Shan Tang, 1982), 6; Joseph Needham and Wang Ling, *Science and Civilisation in China: volume 3, Mathematics and the Sciences of the Heavens and the Earth* (Cambridge: Cambridge University Press, 1959), 388 fig. 176.

[61] Yi Shitong, "The Kangxi Celestial Globe: a Milestone in the History of Sino-Western Cultural Exchange," in *Ferdinand Verbiest: Jesuit Missionary, Scientist, Engineer and Diplomat*, ed. John Witek (Nettetal: Steyler Verlag, 1994), 165-82; Noel Golvers, *The Astronomia Europaea of Ferdinand Verbiest* (Nettetal: Steyler Verlag, 1993), 97-98; Needham and Wang Ling, *Mathematics*, 450-1, fig. 189.

[62] Cranmer-Byng, *Embassy to China*, 93, 265 and Cranmer-Byng, "Macartney's Embassy," 150.

[63] Caird to Ramsay Macdonald, 20 December 1933, in Kevin Littlewood and Beverly Butler, *Of Ships and Stars: Maritime Heritage and the Founding of the National Maritime Museum, Greenwich* (London: Athlone Press, 1998), 68.

only item that day. £105 was paid for it, by no means an exorbitant price. (Compare the entry for a 1794 portrait of Admiral Lord Howe by John Singleton Copley bought a few weeks later for £550). As ever, Caird's agent was Captain Jack Spink, habitué of sale-rooms and dealers across Europe. In October 1934 Caird took all of the naval-related objects and paintings that he had acquired at that point and presented them, with four large printed books cataloguing each item, to the museum. This became the Caird Collection. Significantly, the purchasers' catalogue already identified the piece, not noted as acquired at any auction, as "depicting the bringing of astronomical instruments by Lord Macartney's mission to the Emperor Kien-Lung, A.D. 1796, with an inscription by the Emperor."[64] It came to Needham's attention in spring 1959. At the suggestion of Francis Maddison, then assistant at the Oxford Museum of History of Science, the National Maritime Museum contacted the great sage because of the obvious chronological incongruity of the figures bearing the goods. Needham responded that "the artist was evidently quite ignorant of the actual nature of the astronomical instruments; he simply drew (though he drew them very nicely) a Jesuit celestial globe of 1679…presumably for the artist it was all the same whether the astronomical equipment was brought by the Jesuits or by the English ambassadors."[65]

Three years later, navigation and astronomy curator David Waters once again contacted the scholars in Cambridge about the tapestry, because there was a plan to hang it as "one of our more important treasures" in the Pond Gallery at Flamsteed House in Greenwich. Needham's team recognized that the globe was that made by Verbiest in the seventeenth century; and conjectured that in fact the tapestry might have been made in the later seventeenth century.[66] The puzzle was widely recognized: in 1962 the pre-eminent sinologist John Cranmer-Byng wrapped his edition of Macartney's journal with an image of the tapestry, remarking that the ignorant artist had copied the Verbiest instruments, not those brought by Macartney.[67] Much more recently, a decade ago the eminent Princeton sinologist Susan Naquin, to whom my analysis is entirely indebted, judged that there is nothing unusual, certainly not imperial, about the tapestry. While the verse and the figure outlines are of woven silk, all other colours are merely painted on. There is a remarkable stylistic and technical contrast between the tapestry and the *Illustrations of the Tribute-bearing People* commissioned for Qianlong in 1761 and the associated imagery of his court painters' work produced at the same period, *Myriad States Coming to Court*, depicting foreign tributaries from Europe and from Asia bringing goods to the imperial capital. In the immediate wake of the failed Macartney embassy, indeed, one Chinese scholar produced a *Great Qing Dynasty World Map of Tribute-bearing Countries* annotated with reflexions on the 1793 British submission to the empire and its contribution of appropriate knowledge to Qing worldly cosmology.[68] Few if any of these materials fit with the layout of the allegedly 1793 Greenwich tapestry, which therefore maintains

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[64] James Caird, *The Caird Collection of Maritime Antiquities* (London: Yelf, 1933), no. 446; Littlewood and Butler, *Ships and Stars*, 80-82.
[65] Hilt to Needham, 1 April 1959 and Needham to Hilt, 18 April 1959, Needham Research Institute Cambridge, MS Needham NR12/SCC2/105/2/1.
[66] Fisher to Needham, 12 April 1962 and Combridge to Waters, 22 April and 8 June 1962, MS Needham NR12/SCC2/105/2/3 and 4.
[67] Cranmer-Byng to Waters, 17 January 1961, MS Needham NR12/SCC2/105/2/2; Cranmer-Byng, *Embassy to China*, x.
[68] Susan Naquin, personal communication, 16 February 2006; Richard J. Smith, *Mapping China and Managing the World: Culture, Cartography and Cosmology in Late Imperial Times* (Abingdon: Routledge, 2013), 76-79.

its quizzical chronological status. It could in fact be a twentieth-century piece, made for a European market soon before its acquisition by Spink in 1933. The goods shown arriving from the British vessel and archived in the tapestry maintain their historical and cross-cultural ambiguities.

These have been stories of several highly equivocal objects: canoes and clocks, electrical machines and axes, celestial globes and breadfruit plants, all transported across the globe and carefully archived by the crew of the arks of trade and empire. The objects in question were equivocal not least because of their relation with temporality. The classical epoch cultivated two enterprises explicitly designed to manage and in some ways fix temporal change: natural history and antiquarian chronology. The link between these two was in part mediated through the favoured myth of Noah ("within the Ark safe forever") whose use stayed effective well into the period of the imperial meridian. Those tasks, of preservation against the ravages of time and of intervention in the process of transformation, still stay central in current information science. The favoured diluvian myth embodies much of what is at stake in the survival and the ambition of contemporary materials and their exhibition, the importance of combining archives and displays then as now: exhaustive information as ark or as flood.[69]

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[69] Daniel R. Headrick, *When Information Came of Age: Technologies of Knowledge in the Age of Reason and Revolution 1700-1850* (Oxford: Oxford University Press, 2000), 217-19; Peter Burke, *A Social History of Knowledge: from the Encyclopédie to Wikipedia* (Cambridge: Polity, 2012), 12-24; Bruno Strasser, "The 'Data Deluge': Turning private Data into Public Archives", in *Sciences in the Archives*, ed. Daston, 185-191.

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